It will be readily recognized that the materials used for manufacture of the mounting housing of the invention may be varied as desired, depending upon the application. Similarly, the physical size and shape of the components may be arranged to accommodate any particular ball grid array device. For example, the contact fingers **40** are shown as axially elongated metal strips as may be cut or stamped from flat ribbon stock. However, the fingers **40** could be formed from wire stock and may be formed into various configurations without departing from the principles of the invention. Likewise, the fingers may be anchored in the socket as desired by any suitable means. If the socket is to be used for burn-in purposes, heat resistant materials, of course, should be employed. The design is particularly attractive for use in hostile environments since, in its preferred embodiment, very few moving parts are employed and the opening and closing functions can be readily automated. Thus the preferred structure is extremely reliable and functional in extended repetitive use.

From the foregoing it will be recognized that the principles of the invention may be employed in various arrangements to obtain the benefit of the many advantages and features disclosed. It is to be understood, therefore, that even though numerous characteristics and advantages of the invention have been set forth together with details of the structure and function of the invention, this disclosure is to be considered illustrative only. Various changes and modifications may be made in detail, especially in matters of size, shape and arrangements of parts, without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed:

1. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face with a plurality of windows therein arranged in a pattern to correspond with and receive terminal balls depending from one face of a ball grid array device when said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) a bending plate having apertures therein substantially corresponding with said windows positioned between said base member and said support member and adapted for lateral movement with respect to said support member;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said bending plate and said free end portion positioned in a window in said support member; and

(e) a cam adapted to move the position of said bending plate laterally with respect to said support member and thereby urge said free end portions into contact with said terminal balls between the centerline thereof and the face from which they depend.

2. Apparatus as defined in claim **1** wherein said free end portion of each of said contact members has a generally central axis and the extreme end of said end portion is deviated from said generally central axis.

3. Apparatus as defined in claim **2** wherein each said extreme end portion extends into a window in the support member but does not extend through said window.

4. Apparatus as defined in claim **1** wherein said cam contacts and moves said bending plate.

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5. Apparatus as defined in claim 1 wherein said cam contacts and moves said support member.

6. Apparatus as defined in claim 4 further comprising spring means to urge said bending plate laterally with respect to said support member.

7. Apparatus as defined in claim 5 further comprising spring means to urge said support member laterally with respect to said bending plate.

8. Apparatus as defined in claim 2 wherein the extreme end of said free end portion of each of said contact members extends into a window in said support member a sufficient distance to contact a [ball] terminal ball positioned in said window between the center of [ball] terminal ball and the face of the device from which such [ball] terminal ball depends.

9. Apparatus as defined in claim 1 further comprising spacers removeably affixed adjacent said support face to at least partially define the periphery of a ball grid array device to be positioned on said support face.

10. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face with a plurality of windows therein arranged in a pattern to correspond with and receive [ball terminals] terminal balls depending from the face of a ball grid array device when said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) biasing means having apertures therein substantially corresponding with said windows positioned between said base member and said support member;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnection end and a free end portion disposed on

opposite sides of a central section with said central section projecting through an aperture in said biasing means and said free end portion defining a generally central axis with the extreme end portion of said free end portion deviated from said central axis and positioned in a window in said support member; and

(e) [(c)] means for moving said free end portions with respect to said window.

11. Apparatus as defined in claim 10 wherein each said extreme end portion extends into a window in the support member but does not extend through said window.

12. Apparatus as defined in claim 10 further comprising spacers removeably affixed adjacent said support face to at least partially define the periphery of ball grid array devices to be positioned on said support face.

13. The combination comprising:

(a) a ball grid array device having a first face and a plurality of terminal balls depending from said first face in a predetermined pattern, each of said [ball terminals] terminal balls defining a geometric center spaced from said first face; and

(b) mounting apparatus comprising:

(i) a support member having a support face with a plurality of windows therein arranged in a pattern to correspond with and receiving said terminal balls depending from said first face of said ball array device;

(ii) a base member;

(iii) a bending plate having apertures therein substantially corresponding with said windows positioned between said base member and said support member; and

COLUMN 9 - Continued

(iv) a plurality of elongated contact members, each having an interconnection end and a free end portion

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disposed on opposite sides of a central section with said central section projecting through an aperture in said bending plate and said free end portion positioned in one of said windows in said support member and terminating between said first face of said ball grid array and the geometric center of a terminal ball.

14. The combination defined in claim 13 wherein said free end portion of each of said contact members has a generally central axis and the extreme end of said end portion is deviated from said generally central axis.

15. The combination defined in claim 14 wherein each said extreme end portion extends into a window in the support member but does not extend through said window.

16. The combination defined in claim 13 including means for moving said free end portions with respect to said windows.

17. The combination defined in claim 16 wherein said means for moving comprises a rotatable cam adjacent said bending plate which, when rotated, coacts with said bending plate to move said plate laterally with respect to said support member.

18. The combination defined in claim 17 wherein said means for moving includes a spring positioned to urge said bending plate laterally with respect to said support member.

19. The combination defined in claim 16 wherein said means for moving comprises a rotatable cam adjacent said support member which, when rotated, coacts with said support member to move said support member laterally with respect to said bending plate.

COLUMN 10 - Continued

20. The combination defined in claim 19 wherein said means for moving includes a spring positioned to urge said support means laterally with respect to said bending plate.

21. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face with a plurality of windows therein arranged in a pattern to correspond with and receive terminal balls depending from one face of a ball grid array device when said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) a bending plate having apertures therein substantially corresponding with said windows positioned between said base member and said support member and adapted for lateral movement with respect to said support member;

(d) a plurality of elongated contact [member] <u>members</u> anchored in said base member, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said bending plate and said free end portion positioned in a window in said support member; and

<u>(e)</u> [(c)] a cam adapted to move the position of said bending plate laterally with respect to said support member and thereby move said free end portions within said windows.

22. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face with a plurality of windows therein arranged in a pattern to correspond with and receive [ball terminals] <u>terminal balls</u> depending from the face of a ball grid array device when said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) biasing means having apertures therein substantially corresponding with said windows positioned between said base member and said support member;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting

through an aperture in said biasing means and said free end portion having an extreme end portion thereon positioned in a window in said support member; and

(e) [(c)] means for moving said free end portions with respect to said window.

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23. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face which supports a ball grid array device and receives terminal balls depending from one face of said ball grid array device when said one face of said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) a bending plate having apertures therein substantially corresponding with said terminal balls positioned between said base member and the support face of said support member and adapted for lateral movement with respect to said support member;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said bending plate and said free end portion extending into said support member; and

(e) a cam adapted to move the position of said bending plate laterally with respect to said support member and thereby urge said free end portions into contact with said terminal balls between the centerline thereof and the face from which they depend.

24. Apparatus as defined in Claim 23 wherein said free end portion of each of said contact members has a generally central axis and the extreme end of said end portion is deviated from said generally central axis.

25. Apparatus as defined in Claim 24 wherein each said extreme end portion extends into a window in the support member but does not extend through said window.

26. Apparatus as defined in Claim 23 wherein said cam contacts and moves said bending plate.

27. Apparatus as defined in Claim 23 wherein said cam contacts and moves said support member.

28. Apparatus as defined in Claim 26 further comprising spring means to urge said bending plate laterally with respect to said support member.

29. Apparatus as defined in Claim 27 further comprising spring means to urge said support member laterally with respect to said bending plate.

30. Apparatus as defined in Claim 25 wherein the extreme end of said free end portion of each of said contact members extends into the window in said support member a sufficient distance to contact a terminal ball positioned in said window between the center of the terminal ball and the face of the device from which such terminal ball depends.

31. Apparatus as defined in Claim 23 further comprising spacers removeably affixed adjacent said support face to at least partially define the periphery of a ball grid array device to be positioned on said support face.

32. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face which supports a ball grid array device and receives terminal balls depending from one face of said ball grid array device when said one face of said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) biasing means having apertures therein substantially corresponding with the locations of said terminal balls positioned between said base member and said support face of said support member;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said biasing means and said free end portion defining a generally central axis with the extreme end portion of said free end portion deviated from said central axis and extending into said support member; and

(e) means for moving said free end portions with respect to said support member.

33. Apparatus as defined in Claim 32 wherein each said extreme end portion extends into a window in the support member but does not extend through said window.

34. Apparatus as defined in Claim 32 further comprising spacers removeably affixed adjacent said support face to at least partially define the periphery of ball grid array devices to be positioned on said support face.

35. The combination comprising:

(a) a ball grid array device having a first face and a plurality of terminal balls depending from said first face in a predetermined pattern, each of said terminal balls defining a geometric center spaced from said first face; and

(b) mounting apparatus comprising:

(i) a support member having a support face which supports a first face of said ball grid array device and receives the terminal balls depending from said first face of said ball grid array device;

(ii) a base member;

(iii) a bending plate having apertures therein substantially corresponding with said terminal balls positioned between said base member and said support member; and

(iv) a plurality of elongated contact members, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said bending plate and said free end portion projecting into said support member and terminating between said first face of said ball grid array and the geometric center of a terminal ball.

36. The combination defined in Claim 35 wherein said free end portion of each of said contact members has a generally central axis and the extreme end of said end portion is deviated from said generally central axis.

37. The combination defined in Claim 36 wherein each said extreme end portion extends into a window in the support member but does not extend through said window.

38. The combination defined in Claim 35 including means for moving said free end portions with respect to said window.

39. The combination defined in Claim 38 wherein said means for moving comprises a rotatable cam adjacent said bending plate which, when rotated, coacts with said bending plate to move said plate laterally with respect to said support member.

40. The combination defined in Claim 39 wherein said means for moving includes a spring positioned to urge said bending plate laterally with respect to said support member.

41. The combination defined in Claim 38 wherein said means for moving comprises a rotatable cam adjacent said support member which, when rotated, coacts with said support member to move said support member laterally with respect to said bending plate.

42. The combination defined in Claim 41 wherein said means for moving includes a spring positioned to urge said support means laterally with respect to said bending plate.

43. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face which receives terminal balls depending from one face of a ball grid array device when said one face of said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) a bending plate having apertures therein substantially corresponding with said terminal balls positioned between said base member and said support member and adapted for lateral movement with respect to said support member;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said bending plate and said free end portion extending into said support member; and

(e) a cam adapted to move the position of said bending plate laterally with respect to said support member and thereby move said free end portions within said support member.

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44. Apparatus for mounting a ball grid array device comprising:

(a) a support member having a support face arranged to receive terminal balls depending from the face of a ball grid array device when said ball grid array device is positioned on the support face of said support member;

(b) a base member;

(c) biasing means having apertures therein substantially corresponding with said terminal balls positioned between said base member and the support face of said support member;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said biasing means and said free end portion having an extreme end portion which extends into said support member; and

(e) means for moving said free end portions with respect to said terminal balls.

45. In apparatus for mounting a ball grid array device having a support member which supports one face of the ball grid array device and receives the terminal balls depending from said one face; a base member; a biasing member positioned intermediate the support member and the base member adapted for lateral movement with respect to said support member; and means for moving said support surface on said support means or said biasing member laterally with respect to the other, the improvement comprising an elongated contact member anchored in said base member having an interconnection end and a free end portion disposed on opposite sides of a central section with said central section projecting through an aperture in said biasing member and said free end extending into an opening in said support member to terminate at a point between the centerline of a terminal ball depending into said opening and the face of the ball grid array device from which said terminal ball depends, said free end portion defining a generally central axis and terminating in an extreme end which is deviated from said central axis.